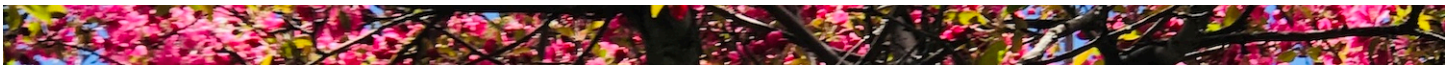
Français

Complexity and Mathematical Logic

May 6-8, 2026



ISM Discovery School: Complexity and Mathematical Logic

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Mathematical Logic has its origins in questions about the foundations of mathematical knowledge and reasoning. The dramatic developments of the 20th century, such as Gödel's incompleteness theorem and the independence of the continuum hypothesis, deeply transformed our understanding of mathematics. The field has evolved significantly since these accomplishments, and remains an extremely active research area these days.

The techniques from Mathematical Logic can be used quite generally to study complexity in mathematics; the complexity of mathematical structures as well as the complexity of proofs. Thus, in parallel to its internal

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advancements, Mathematical Logic developed close connections and applications to other areas of mathematics. Early applications were focused on discrete mathematics. Turing's work on Gödel's theorem lead the way to Computability Theory (and later Computer Science), and Model Theory found numerous applications in Algebra and Combinatorics. Descriptive set theory, and more recently Continuous Model Theory, are commonly applied to various areas of Analysis, especially Dynamical Systems, Ergodic Theory, and Operator Algebras.

The main aim of this ISM Discovery School is to expose graduate and advanced undergraduate students to a wide range of topics in mathematical logic and related areas.